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Session: CURRENT STUDIES IN UNDERWATER ARCHAEOLOGY

Chairman: Ms. Melanie Stright

Date: November 28, 1984

Presentation Title	Speaker/Affiliation
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New Ground Reef Shipwreck Investigations in the Eastern Gulf of Mexico	Mr. James Parrent Texas A&M University
Geomorphological Research in the Atchafalaya Basin and Terrebonne Marsh	Dr. Lawson M. Smith U.S. Army Engineer Corps Waterways Experiment Station Mr. Thomas Ryan U.S. Army Engineer District, New Orleans
Survey, Mapping and Site Reconstruction in a Blackwater Environment: A Study in Methods	Mr. Richard J. Anuskiewicz MMS, Gulf of Mexico Region
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SESSION OVERVIEW: CURRENT STUDIES IN UNDERWATER ARCHAEOLOGY

Ms. Melanie Stright
MMS, Gulf of Mexico Region

Our session, Current Studies in Underwater Archaeology, consisted of two papers on historic shipwreck investigations and three papers on studies in prehistoric archaeology.

James Parrent, currently working in the Gulf of Mexico Regional Office on an inter-governmental personnel agreement from Texas A&M University, discussed the recent MMS investigations of 17th century English slave ship on New Ground Reef. This investigation was conducted at the request of the State of Florida for MMS to evaluate the site's eligibility for the National Register of Historic Places. As a result of the MMS on-site investigation it was discovered that there are still portions of the ship's hull in place on the sea floor. Various artifacts observed included two cannons, ivory, and two large metal boxes.

Based on our diver's evaluation of this site, MMS recommended that it not be nominated to the National Register for the following reasons: (1) only a limited number of diagnostic artifacts remain on the site; (2) the integrity of the site has been severely disturbed by treasure hunting activities; and, (3) the continuing activity on the site by treasure hunters will, undoubtedly, further degrade the site.

The second paper on shipwreck archaeology was given by Rick Anuskiewicz, Staff Archaeologist, MMS Environmental Operations Section, formerly of the Army Corps of Engineers in Savannah, Georgia. Mr. Anuskiewicz reported on seven years of work he's conducted on the USS GEORGIA off Savannah. This civil war shipwreck lies along the Corps of Engineers' dredge channel in a black water environment.

Mr. Anuskiewicz's paper demonstrated that not only can proper archaeological techniques be employed in underwater archaeological investigations but also that proper archaeological techniques can be employed in a black water environment. The initial investigation of the site was done by remote sensing, with depth sounders and side scan sonar. Based on the remote sensing data, the wreck site was mapped and a dive plan was formulated.

As work progressed, prior to removal of any objects from the wreck site, the objects were buoyed and shot in with transits in order that their proper locations could be recorded.

Mr. Anuskiewicz indicated that the Corps will have to do more work on this wreck and possibly excavate the entire site due to the Corp's plans to further widen the shipping channel in Savannah harbor. There may be no way to protect the wreck in-situ from future dredging activities.

Our first paper on prehistoric archaeology was delivered by Dr. Lawson Smith, a geomorphologist and Chief of Regional Geologic Studies with the Geotechnical Lab Waterways Experiment Station for the Corps of Engineers in Vicksburg, Mississippi. Dr. Smith reported on current archaeological and geomorphological research in the Atchafalaya Basin and Terrebonne Marsh. This study is designed to reconstruct the paleogeography of the Atchafalaya Basin and Terrebonne Marsh in order to provide the basis for management decisions regarding future archaeological survey requirements, including the level and type of survey which should be employed. The paleoenvironmental reconstruction and predictive modeling approach to prehistoric site location being used in the Corps of Engineers study is very much like the management approach being employed by MMS on the Gulf of Mexico Outer Continental Shelf. In both cases, existing remote sensing data, regional geologic studies, sea level curves, and foundation borings are used for paleogeographic reconstruction. These findings are then used to determine the potential for prehistoric site occurrence and preservation.

In summary, Dr. Smith's paper demonstrates that the archaeological techniques and methods being employed on land for prediction of site locations and for management decisions are identical to those being employed on the Outer Continental Shelf. Only the working environment differs.

Our second paper on prehistoric archaeology was delivered by Dr. Charles Pearson, Project Leader for a current MMS study entitled "Prehistoric Site Evaluation on the Northern Gulf of Mexico OCS: Ground Truth Testing of the Predictive Model." This study was funded by our Washington Office and is designed to test the predictive model for prehistoric site occurrence that's been used as the basis for MMS cultural resources management decisions in the Gulf of Mexico since the cultural resources baseline study in 1977. The study is also designed to test our current technology and methods for evaluation of potential prehistoric site locations on the OCS. During the first phase of this study, original seismic data were collected along the ancient Sabine River Valley, which trends offshore between Louisiana and Texas. Based on these seismic data specific areas having a high potential for prehistoric sites to occur and be preserved were outlined within the ancient river valley. High probability areas identified from the data include several levels of terraces, individual channel courses within the major river valley, point bars, and possible natural levee deposits. Based on these seismic data, more specific areas were identified where vibracores would be collected in order to obtain a soil sample from potential site locations. The vibracoring phase of the study has just been completed. The cores are currently being cut and photographed. The next phase of the study involves coarse-fraction and geochemical analysis of selected samples from the cores in an attempt to identify culturally deposited sediments and material.

The last paper was presented by Dr. Lawrence E. Aten, Chief of the Inter-agency Resources Division of the National Park Service in Washington, D.C. Dr. Aten reported on a site at the Texas City Channel in Galveston Bay, where a Corps of Engineers dredging project has turned up fossil material that appears to have been culturally modified

by percussion flaking. Dr. Aten in consultation with Carolyn Good, archaeologist for the Corps of Engineers in Galveston, has determined that there are numerous artifact types present in the redeposited fossil material.

Apparently the fossilized material, rather than lithic material, was being used by prehistoric man in the local area as a source for tool manufacture. This site, and a site along the extreme eastern Texas coast, the McFadden Beach Site, show that prehistoric man was in the Gulf Coast Region at least 10,000 years ago. It should be noted that these sites are very close to the MMS study area offshore where similar sites would have been inundated as a result of Holocene sea level rise.

At the time these sites were formed, Galveston Bay and McFadden Beach were upland settings, with the shoreline at approximately the 30 meter bathymetric contour. These findings demonstrate that man was in the Gulf Coast area at least 10,000 years ago; and that prehistoric sites can be anticipated on the continental shelf at least out to the -30 isobath. The goal of MMS's current study is to produce evidence of these preserved inundated sites on the OCS.

NEW GROUND REEF SHIPWRECK INVESTIGATIONS IN THE EASTERN GULF OF MEXICO

Mr. James Parrent
MMS, Gulf of Mexico Region

In May 1984, an archaeologist working for Treasure Salvors, Inc., contacted the Florida Division of Archives, History and Records Management about the nomination of a shipwreck site to the National Register of Historic Places (NRHP). The shipwreck lies on New Ground Reef about 34 miles west of Key West, Florida. Since this area is outside of state waters, on the outer continental shelf (OCS), Florida officials contacted Dr. Friedman, Minerals Management Service (MMS) Consulting Archaeologist, Washington, D.C., for assistance in the nomination process. In turn, the MMS Gulf of Mexico Regional Office was directed to investigate the site to determine its eligibility for nomination to the NRHP.

I went to Tallahassee, Florida to consult with state archaeologists and conduct a file search on the wreck site. A file search revealed the following:

1. The site consists of a shipwreck dating from approximately 1689 to 1710. Portions of the site have been salvaged under State of Florida Contract S-13. When the site was examined in the early 1970s, large portions of the ship's wooden hull and portions of the ship's frames remained. Most of the wreck was in good physical condition and two cannons and two anchors were located.

2. Judging from the size of the wreck site and from the numbers and types of artifacts recovered, it is estimated that the ship was a small vessel weighing one hundred tons or less, lightly armed, and of English origin. The artifacts recovered included such unique items as pewter bottles of the "onion bottle" type, German silver drinking steins, elephant ivory, and iron shackles. In addition there were swords, small arms, cannon balls, silver spoons, leather fragments, an English copper

coin dated 1689, and a Spanish coin bearing no date.

3. An assessment of the geographic origin of the ship is based on the recovered artifacts. Spanish and Portuguese vessels of this period usually carried more ceramic containers than metallic. It is further speculated that it was either a merchant or pirate vessel, since the wreck site is in a major Spanish shipping corridor and vessels of foreign nationality are known to have preyed upon Spanish fleets. The uniqueness of this particular wreck, therefore, is that it is not a Spanish vessel and there are few recorded early English shipwrecks from this region during this time period.

Between August 1972 and June 1974, the site was worked extensively by treasure hunters under contract with the State of Florida. In 1976, a Supreme Court decision defining Florida State waters placed the wreck outside of Florida's jurisdiction. The shipwreck site lay undisturbed from 1974 until 1982, when Treasure Salvors, Inc., put a subcontractor on the site. It was in 1982 that a bell with the inscription "The Henrietta Marie 1699," was recovered from the site.

I conducted an on site investigation in September 1984. Leasing and Environment, GOM OCS Region (LE), staff members, Mr. Joe Christopher, Environmental Specialist; Mr. Joe Perryman, Oceanographer; and National Park Service (NPS) personnel, Mr. Jack Morehead, Superintendent of Everglades National Park, Mr. Jim Tillmont, Marine Research Scientist, Mr. Cliff Green, Captain of NPS boat ACTIVA; and Mr. David Moore, Archaeologist for Treasure Salvors, participated in the site investigation.

The site was located on the first day, September 14, 1984, and its perimeter was established. On September 15, 1984, artifacts visible on the seafloor were photographed and measured. Surface collecting has depleted the artifact assemblage reported by Larry Murphy in 1972. Mr. Murphy was a Florida State Archaeologist when the site was first discovered and is now a member of NPS Submerged Cultural Resource Unit in Santa Fe, New Mexico.

Our divers identified the following artifacts on the seafloor: 1) two wooden ship frames lying loose; 2) wood ship frames, dead wood, and planking, the upper portions of which protruded from the seafloor; 3) remains of two large metal box-like structures; 4) two ivory tusks, one of which is protruding from under the larger of the metal boxes; 5) two iron cannons about six feet in length; and 6) one pair of slave shackles.

To further complicate the status of the shipwreck site, a treasure salvor, Toney Kopp, on his boat ALLUSION met us at the site on our first day out, September 14, 1984. Mr. Kopp said that Mel Fisher, President of Treasure Salvors, Inc., had given him the Loran coordinates to the site. Mr. Kopp also stated that Mr. Fisher had given him the rights to the shipwreck.

Divers from the ALLUSION were first to discover one of the cannons and placed a buoy on it. The ALLUSION crew was friendly, helpful, and readily shared artifact locations with us. However, they began recovering artifacts from the site and said they planned on working the site for several days. Divers from the ALLUSION made no pretense of conducting any type of archaeological survey, but instead commenced to randomly search for and collect artifacts.

We departed the site Friday afternoon and returned on Saturday morning. The ALLUSION crew was in the water working with an air dredge and metal detector. I observed two divers, one with a metal detector and one with a collecting bag, searching the seafloor and collecting artifacts. There was no control grid or any other observable device which would offer any clue as to where the artifacts had lain before they were bagged. This incident raises questions about the motives and sincerity of Treasure Salvors' nomination of this site to the NRHP.

Wood samples from the ship's frames, strakes, and the bilge pump, which had been removed previously by Treasure Salvors, were sent to the Center for Wood Anatomy, U.S. Forest Products Laboratory, Madison, Wisconsin. The frame and strake were identified as white oak and the bilge pump was constructed from beech wood.

Based on the following reasons, the site was not recommended for nomination to the National Register for Historic Places: 1) only a limited number of diagnostic artifacts remain on the site; 2) the integrity of the site has been severely disturbed; and 3) the continuing activity on the site by treasure hunters will undoubtedly further reduce the artifact assemblage.

GEOMORPHOLOGICAL RESEARCH IN THE ATCHAFALAYA BASIN AND TERREBONNE MARSH

Dr. Lawson M. Smith
U.S. Army Engineer Waterways Experiment Station
Mr. Thomas Ryan
U.S. Army Engineer District
New Orleans

The geomorphic investigation of the Atchafalaya Basin and the Terrebonne Marsh of southern Louisiana is the initial step in a multi-phased approach to identifying and managing the area's prehistoric cultural resources. The geomorphic study is designed to provide an environmental framework for estimating site probability areas, to aid in establishing site significance, and to serve as a guide for planning future investigations. Results of the geomorphic study will also serve as the initial planning document for executing a programmatic memorandum of agreement with the Louisiana State Historic Preservation Officer and the Advisory Council on Historic Preservation.

An understanding of the evolution of the physical landscape and the basic landforming processes is critical to the identification and evaluation of the prehistoric cultural resources of a region. In support of future cultural resource surveys of the Atchafalaya Basin and the

Terrebonne Marsh, a geomorphic study of the area is being conducted to provide an outline of landscape evolution. There are two primary objectives of the study. The initial objective is to describe and delineate on detailed maps the geomorphic features (landscape elements) of the study areas. The second objective is to analyze the geomorphic development (landscape evolution) of the study areas, especially as landscape evolution relates to prehistoric man/land relationships.

Description and cartographic delineation of geomorphic features of the study areas was completed in August 1984. Twenty classes of geomorphic features were mapped on fifty-five 1:24,000 U.S. Geological Survey quadrangles. Data used to delineate the geomorphic features consisted primarily of various scales, dates, and types of aerial photographs and LANDSAT imagery. Additional data used to identify geomorphic features included historic maps, charts, and surveys and existing subsurface boring logs.

In pursuit of the second objective, a field investigation program was planned to provide detailed paleoenvironmental data at critical locations in the study areas. Subsurface samples were obtained by vibracoring at 31 locations (to depths of 9 meters) and by traditional rotary methods (to depths of 30 meters) at seven sites. Subsequent laboratory analyses of the cores, including characterization of depositional environment, complete x-radiography, biostratigraphic analyses, and radiocarbon dating, are yielding substantial paleoenvironmental data. These data are being integrated with existing data and the geomorphic maps to provide a geomorphic chronology for the evolution of the study areas during the Holocene.

At the present time, the analysis of field and geomorphic mapping data has just begun, with a preliminary draft of the report scheduled for March 1985. Major questions addressed include the following:

- Is there a buried pre-Teche Holocene Mississippi River meander belt in the Atchafalaya Basin?
- What are the depositional processes (and related

paleoenvironments) responsible for the Holocene sedimentary filling of the Atchafalaya Basin?

- What were the processes and chronology of closure of the Atchafalaya Basin during the Holocene?
- In the last several thousand years, what has been the history of Grand Lake in the Atchafalaya Basin?
- In the Terrebonne Marsh, what sedimentary cycles exist, and what are their times of formation?
- Have any of the Teche distributary channels been occupied later by the Lafourche distributaries or the Red River?
- Is there a pre-Teche Holocene distributary system in the Terrebonne Marsh?
- What is the origin of the shell ridges in the Terrebonne Marsh?

Answers to these questions have substantial significance to the development of an environmental framework necessary for the comprehensive and cost effective survey of prehistoric cultural resources in the study areas.

SURVEY, MAPPING AND SITE RECONSTRUCTION IN A BLACKWATER ENVIRONMENT: A STUDY IN METHODS

Mr. Richard J. Anuskiewicz
MMS, Gulf of Mexico Region

The basic research goals in underwater archaeology are the same as those in terrestrial archaeology: to pursue and document replicable information through the scientific method. The only differences between the two approaches to gathering information are the methods and the working environment. The focus of this paper will be on the development and operationalization of field techniques to survey, map, and

reconstruct a shipwreck site in a blackwater environment. I define blackwater as the total absence of light as a result of suspended particulates, either organic or inorganic, in the water column. Working and conducting research in zero visibility poses some rater unique methodological problems. This paper will recognize and address many of the problems and offer solutions to a problematic approach to doing archaeology in blackwater. A survey, mapping, and site reconstruction model will be presented using the research data generated by the U. S. Army Corps of Engineers, Savannah District, in their intensive study of the sunken Confederate Ironclad, the C. S. S. GEORGIA. The model presented will include the compilation of traditional remote sensing data (i.e., magnetometrics, side-scan sonar, and sub-bottom profiler) with the integration of computer-generated graphics and the three-dimensional grid element contour display of site model bathymetric data.

INITIAL GEOARCHEOLOGICAL EVALUATION OF THE TEXAS CITY CHANNEL SITE (41 GV 81), GALVESTON COUNTY, TEXAS

Dr. Lawrence E. Aten
National Park Service
Ms. Carolyn Good
U.S. Army Corps of Engineers, Galveston District

Since the early 1900s, the U.S. Army Corps of Engineers has maintained a navigation channel from Texas City southeastward to the centerline of Galveston Bay on the upper Texas coast. This channel has been maintained by repeated dredging operations, creating the disposal bank known as the Texas City dike. For many years collectors have searched the dike for vertebrate fossils resulting in collections numbering thousands of specimens. Recently, examples of fossils have been recognized that appear to have been modified culturally into

various tool-like forms. Determining whether these fossils are artifacts is a complicated taphonomic problem because the site and the materials have had a complex depositional and post-depositional history.

The focus of our ongoing research at the Texas City Channel Site is to identify the details of the locality's geologic history; to evaluate the nature and significance of these tool-like specimens from a cultural perspective; and to determine, among other things, whether such a site has implications for management of cultural resources on the continental shelf. This has entailed developing discriminating criteria for testing the characteristics of tool-like fossils so that a satisfactory conclusion may be drawn about their origin. If the outcome of this investigation supports the cultural nature of these materials, as now seems to be strongly indicated, the Texas City Channel Site (TCC) has major implications for documenting the cultural history of early populations on the northern Gulf Coast.

THE MATERIALS

We have examined three separate collections totaling approximately 4,000 fossil specimens. Of these, 42 display evidence of cultural modification. In addition, one of the collections included half of a fossil human femur. Lithic material is extremely rare on the dike; no chipped stone and only 3 unmodified pebbles are known to have been collected.

All of the modified fossils except two display convincing evidence that they were altered after they had become fossils. The criteria used to determine modification relate to surface condition; the color, arrangement, and the shape of flake scars; shape and alignments of cut marks, striations, and wear facets; and the relationship of abrasion wear on alternately hard and soft bone surfaces comprising certain specimens, especially teeth.

The physical character of the modified fossils that conform to our present criteria can be synthesized into 8 categories which we are treating as potential form/function classes. These are described below.

(1) Work platforms: flat, sometimes cylindrical bone surfaces usually bearing numerous cut marks oriented predominantly in one direction. (4 specimens).

(2) Unifacial cutting edge tools: usually flat bones unifacially chipped to a low angle bit of about 45 degrees. (4 specimens).

(3) Bifacial cutting edge tools: fossils with narrow but rounded natural edges that are bifacially flaked to create a typical biface cutting edge. (3 specimens).

(4) Incidental cutting tools: analogous to "used flakes"; usually small, naturally sharp fossil bone elements with unpatterned flakes, microflakes, abrasion, and striations along the used edge. (12 specimens).

(5) Bit scrapers: coarse-textured turtle plastron with a well-developed unifacial rasping bit (about 45 degrees); this tool has other wear facets suggesting it was hafted. (1 specimen).

(6) Mandible scrapers: horizontal ramus sections of carnivore and cervid mandibles on which the molar/premolar cusps have been abraded or shattered; high use angles (about 76 degrees). (7 specimens).

(7) Chopping tools: heavy bison metapodial with a wedgeshaped bit formed by the convergence of spiral fractures in the mid-section of the shaft; random microflaking occurs along the distal edge. (1 specimen).

(8) Pounding tools: usually an elongate bone or tooth with one end battered and the opposite end smooth. This group includes a hammerstone and pestle-like tools; others may be spent chopping tools. (8 specimens).

Two additional fossil bones appear to have been modified before fossilization and in a manner different from the probable artifacts described above. One was a horse radius that had been "whittled" to thin the compact bone of the shaft which was then snapped in half. The other appears to be a tapir metapodial which has deep V-shaped grooves cut in the center of the shaft and, again, the bone was snapped in half.

At least three separate types of fossilization are represented on the fossil bones we have examined: (1) those with bone replacement plus extensive secondary carbonate deposition; (2) bone replacement only; and (3) both previous types with pyritization as well. We believe that these

correlate with key phases of the locality's geologic history, as will be discussed below. The majority of the tool-like specimens are fossilized either as type 1 or type 3; the human femur and the two bones that appear to have been modified before fossilization are now fossils of type 2.

THE SITE SETTING

The fossils have been collected from a section several miles long on the Texas City Dike. We have reviewed core logs from several borings made adjacent to the Texas City Channel, and from others made in the southern part of Galveston Bay. These reveal a sequence of deposition that is readily interpretable in terms of the general geologic framework of the bay. This local depositional history begins with a late phase of the Beaumont Formation--a meander belt of probable Farmdalian age (about 25,000 to 30,000 years ago); this is probably the source of the type 1 fossil bones. This zone is overlain by a basal transgressive sand followed by a sequence of marsh and estuarine deposits apparently representing upper bay facies superimposed by middle bay facies.

We have attempted to reconstruct the area's paleogeography at the time of the Pleistocene/Holocene transition by mapping topographic contours from core data on top of both the Beaumont Formation and the Deweyville channel sediments in the Trinity River trench. This indicates that the Texas City Channel is located near the crest of a ridge about 4-5 kilometers west of the large Deweyville-Trinity River floodplain. The ridge was underlain by Farmdalian Beaumont sediments and was deeply incised by ancestral Highland Bayou, a local drainage tributary to the Trinity. Because the Beaumont Formation meanderbelt ridges in the Galveston Bay area frequently are fossiliferous, we assume that the entrenched streams cutting the ridge exposed older fossil deposits that were collected or mined by early man. Because the Galveston Bay area has no indigenous lithic sources for tool manufacture, it is not unusual for alternative materials such as fossil bone to be collected and put to this use.

Although the age at which the ridge would have been submerged by the enlarging bay can be estimated at circa 5,000 to 6,000 years ago, the presence of extinct tapir and horse bones which appear to have been modified before fossilization (while the majority of other bones appear to have been modified long after fossilization) indicates the age of the cultural activity to be on the order of late Pleistocene, or about 13,000 to 10,000 years ago. Pyritization (type 3 fossils) then occurred after the locality was submerged by the advancing bay fringe marshes during the Holocene.

SITE RELATIONSHIPS

While we have not yet established the TCC Site as of unequivocal archeological origin, the evidence is mounting to the point that it may be contrasted to other sites of comparable age from the region. Three immediately come to mind: Owen, Salt Mine Valley, and McFaddin Beach.

The nature and significance of each of these sites has been reviewed in Aten (1983: 144-152). Briefly, paleogeographic reconstructions indicate that Owen probably reflects hunting camps in the interior woodlands, Salt Mine Valley reflects the coastal zone, and McFaddin Beach and TCC both reflect activities in the interior near the major riverine habitats of that day. These relationships are illustrated below.

< INTERIOR ><	><	>< COASTAL >
< WOODLANDS>< RIVERINE ><	PRAIRIE? ><	ZONE >
* Owen Site	* TCC Site * McFaddin B.	* none known	* Salt Mine Valley

This lateral ecological differentiation is probably at least part of the explanation for tool assemblage differences between these early sites. TCC, if it can be verified, contained a diversified processing tool assemblage, not a hunting assemblage, and is unlike those from the other sites.

SITE IMPLICATIONS

If we assume, as a preliminary matter, that TCC is indeed an archeological site, its significance will be that it enables us to further describe the technological, settlement, and adaptive characteristics of Paleo-Indian cultures along the continental margin. These remain poorly known because of the inaccessibility of their sites which are now submerged or buried, or both. As a result, cultural reconstructions for that period are strongly biased toward concepts of uplands hunting adaptations.

For OCS management, TCC suggests several additional things. First, it provides new Gulf Coast evidence that archaeological sites may survive transgressions in at least some geomorphic situations; this is an excellent illustration of the lithosome preservation model of Belknap and Kraft (1981). Second, it lends support to the importance of searching for buried archeological sites along the valley margins of major floodplains submerged on the continental shelf as is now being done in the Minerals Management Service's submerged Sabine-Neches Valley ground-truth study. And third, the site setting of both TCC and the McFaddin Beach Site suggests the need to give greater attention to subbottom profile data interpretation of the dissected valley margins along major floodplains.

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